

REMARKS

Applicant' invention, as recited by present claims 1-6, 8-15, 17-27, and 29-32 is directed to a nonwoven, fibrous mat comprising chopped glass fibers having a relatively small range of average fiber diameters, and a gypsum board faced with such a mat. In various embodiments, the gypsum board exhibits a combination of desirable structural and functional features that render it fire resistant and easily painted or otherwise given an aesthetically pleasing finish after installation with a minimum of surface preparation required. The mat has a high permeability, permitting easy extraction of excess water ordinarily present during slurry-based manufacture of gypsum or other hydraulic set board. Surprisingly and unexpectedly, gypsum board faced in accordance with the invention with the present nonwoven glass fiber mat, wherein the fibers consist essentially of chopped glass fibers having an average fiber diameter ranging from about 9.5 to 12.5  $\mu\text{m}$  and an average fiber length ranging from about 6 to 12 mm, has a smoother surface than boards made with mats employing either larger or smaller diameter fibers. It is especially surprising and significant that the aforementioned 9.5 to 12.5  $\mu\text{m}$  fibers result in smoother board than that obtained with fibers having a smaller diameter. It is likewise surprising and unexpected that a gypsum board having a facer wherein the average glass fiber diameter is 9.5 – 12.5  $\mu\text{m}$  and the average fiber length is 6 – 12 mm is smoother than board faced with mat having the same diameter but fiber length of 19 mm (3/4").

Claim 28 stands withdrawn as being directed to a non-elected invention and claim 16 was previously cancelled.

The Examiner's withdrawal of: the rejection of claim 16 under 35 USC 112, second paragraph; the rejection of claims 1-3, 7-15, 17-18, 21-24, 27, 29, and 32 under 35 USC 102(b) over Jaffee; and the rejection of claims 1, 16, and 25 under 35 USC 102(b) over Kennedy et al., are noted with appreciation.

Claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32 were rejected under 35 USC 103(a) as being unpatentable over US Patent 5,772,846 to Jaffee, which provides a thermoformable nonwoven fibrous mat having properties said to make it particularly suited for a facer on insulating gypsum board.

Applicant respectfully submits that the gypsum board delineated by claims 1-6, 8-15, 17-19, 21-24, and 26-27; the fibrous mat recited by claims 29-31; and the hydraulic set board of claim 32 are not disclosed by Jaffee. While Jaffee admittedly discloses, in general terms, a nonwoven fibrous mat for use as a facer on gypsum insulating board, applicant maintains that Jaffee fails to disclose or suggest the particular mat recited by applicant, let alone a gypsum board faced with mat delineated by the foregoing claims.

With respect to claims 1, 19-22, 27, and 32, and referencing col. 2, lines 1-15, the Examiner has pointed to Jaffee as teaching a nonwoven fibrous mat for use as a facer on gypsum insulating board. The mat is said to comprise a major portion of textile glass fibers

and a minor portion of polymer fibers (col. 2, lines 50-60). The Examiner has equated the latex binder of Jaffee (col. 2, lines 35-45) with applicant's resinous binder. In addition, the Examiner has indicated that Jaffee teaches glass fibers having an average fiber diameter from about 9 to 20 microns (col. 3, lines 35-40) and a length between 0.25 and 1 inch (col. 3, lines 55-60).

By way of contrast, applicant's claims 1, 27, and 32 (and claims 20-22 dependent on claim 1) recite a nonwoven fibrous mat comprising a web of chopped glass fibers of particular diameters and lengths. The fibers of the web consist essentially of glass fibers having an average fiber diameter ranging from about 9.5 to 12.5  $\mu\text{m}$  and an average fiber length ranging from about 6-12 mm. Applicant does not employ the polymer fibers disclosed by Jaffee. Significantly, the Examiner has not pointed to any disclosure or suggestion of such diameter and length ranges in combination. In addition to the 9-20 micron fibers identified by the Examiner at col. 3, line 39, Jaffee is submitted to disclose preferred fibers having fiber diameters of 10-16 microns (col. 3, line 40); 16 microns (col. 3, line 42, col. 5, line 1, and claim 13); 13 microns (col. 6, line 67); and 15 microns (col. 3, line 8). Jaffee further teaches the preferability of mat comprised of a fiber blend including both glass fibers of the aforementioned diameters and organic microfibers. Clearly, none of these chopped glass fiber diameter species disclosed by Jaffee falls within the 9.5 to 12.5  $\mu\text{m}$  range recited by claims 1, 27, and 32. Neither does any mat species disclosed or suggested by Jaffee incorporate fibers having an average fiber diameter falling within applicant's range of about 9.5 to 12.5  $\mu\text{m}$ .

Even less is there any disclosure or suggestion of gypsum or hydraulic set board comprising mat having a web of fibers of such diameter.

The Examiner has discounted the use of the transitional phrase "consisting essentially of" as follows:

In regards to the transitional phrase "consisting essentially of," the phrase limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. *In re Herz*, 537 F.2d 551-552, 190 USPQ 461, 463 (CCPA 1976). The burden is upon the applicant to show that the additional components do not affect the basic and novel characteristics of the invention. For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising". See, e.g., PPG, 156 F.3d at 1355, 48 USPQ2d at 1355. See MPEP 2111.03.

Applicant respectfully points out that the transitional phrase "consisting essentially of" was incorporated in claims 1, 22, 27, 29, and 32 in lieu of "composed of" by way of applicant's most recent amendment under 37 CFR 1.111 entered on May 9, 2006. The same text was earlier proposed in applicant's after-final amendment under 37 CFR 1.116 submitted on October 10, 2005, but not entered.

In the present instance, it is further submitted that the specification, when read as a whole by a person of ordinary skill in the art, and as inferred by the Examiner, would clearly indicate the subject matter intended. For example, applicant respectfully points to: (i) the recitation of the Field of the Invention at page 1, lines 8-9, of a glass fiber mat employing fibers having "a narrow range of diameters" used in producing gypsum board; (ii) the narrow range of diameters of fibers in preferred mats delineated at page 7, lines 17-20; and (iii) the

benefits of a narrow range of diameters set forth at page 7, lines 27-32. Attention is further drawn to the specification at page 7, lines 23-26, wherein it is observed that a person having ordinary skill in the glass fiber art would recognize that a small fraction of fibers broken into two or more pieces and a very small fraction of small glass fibers and chips are commonly present in a chopped fiber product.

Applicant respectfully submits that the replacement of the term "composed of" with the partially closed transitional phrase "consisting essentially of" in claims 1, 22, 27, 29, and 32 clearly signals applicant's understanding of claim scope, in accord with firmly established Patent Office practice. Applicant has employed the transitional phrase "consisting essentially of" in a manner that is consistent with the meaning delineated in MPEP §2111.03, quoting *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original), which the Examiner has cited. Such usage, articulated long ago in *Ex parte Davis*, 80 USPQ 448, 450 (Pat. Off. Bd. App. 1948), has since been repeatedly affirmed. See, e.g., *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1239, 68 USPQ2d 1280 (Fed. Cir. 2003).

Applicant thus respectfully submits that the specification and file history of the present application provide sufficient basis for understanding the ambit of the present claims. That is to say, the specification recites those basic and novel characteristics of the anchoring device that would be materially affected by the presence of elements in an embodiment that would be outside the scope of the claim, and thus excluded by use of the "consists essentially of" transitional phrase.

Applicant further submits that nothing in the record establishes that the Examiner, in applying the broadened ("comprising") construction of MPEP §2111.03, has made a determination of the basic and novel characteristics pertinent to consideration of the scope of claims 1, 22, 27, and 32, which employ the phrase "consisting essentially of." Applicant maintains that such a determination must be made for the "comprising" construction to be permissible. It is further submitted that the determination of the basic and novel characteristics must be documented to permit appropriate appellate review of the propriety of the rejections. See *In re Lee*, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1435 (Fed. Cir. 2002) (holding that PTO must document its reasonings on the record to allow accountability and effective appellate review). In the present instance, applicant respectfully submits that the intended claim scope is indeed apparent from the original specification and claims, and, *a fortiori*, in view of the file history.

It is established law that a reference that describes subject matter delineated by a numerical range of composition at best establishes the *prima facie* obviousness of a claim delineating a different range that is narrower or overlapping. However, any such *prima facie* obviousness is rebuttable by a showing of surprising and unexpected results. In the present instance, claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32 clearly recite numerical ranges. More specifically, claims 1, 27, 29, and 32 (and claims 2-6, 8-15, 17-19, 21-24, and 26-27 dependent on claim 1 and claims 30-31 dependent from claim 29) delineate a web composed of chopped glass fibers having an average fiber diameter ranging from about 9.5 to 12.5  $\mu$ m

and an average fiber length ranging from about 6 to 12 mm. Claims 4-6, 8-9, 14, 17-19, 22, and 30-31 recite additional features of preferred embodiments delineated by way of other numerical ranges. While the existence of a prior art species falling within a claimed generic range has been held to anticipate the claimed genus, in the present instance no species of Jaffee has been identified that falls within the claimed ranges.

Applicant continues to maintain that the surprising and unexpected results delineated by the instant specification rebut any purported conclusion that the subject matter delineated by claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32 is obvious over Jaffee.

Significantly, Jaffee contains no disclosure or suggestion concerning any of the beneficial properties afforded by the board and mat of the present invention. Even less does Jaffee provide any teaching or guidance that would direct an artisan to the particular ranges set forth, e.g. by independent claims 1, 27, 29, and 32, whereby these beneficial properties are attained. It is respectfully submitted that the Examiner has not pointed to any disclosure or suggestion in Jaffee or elsewhere in the prior art to the contrary. As set forth by the specification, preferred embodiments of applicant's gypsum board provide, *inter alia*, flame resistance (page 10, lines 19-22) and high permeability of the mat that permits easy extraction of excess water present in the gypsum slurry during board fabrication (page 11, lines 19-34). However, it is submitted to be of particular significance that these properties are attainable in combination with the desirable "hand" of the present mat and board, which permits easy application of surface finishes (such as paint) to installed board without extensive surface preparation (page 8, lines 5-14 and page 7, lines 11-14). Such benefits are surprisingly absent

from boards made from fibers having diameters falling within other narrow ranges that are outside those required by applicant's claims.

Further with respect to the question of obviousness, applicant directs attention to the following statement in the specification at page 7, lines 27-32:

However, it is surprising and unexpected that gypsum board produced using mat formed with fibers having a diameter within a narrow range centered at about 11  $\mu\text{m}$  is considerably smoother than board faced with mats wherein the fibers have a narrow range of diameters centered about 16, 15, 13, 8, and 5  $\mu\text{m}$ , and smoother than other fiber-faced gypsum boards known in the art.

Applicant respectfully submits that such a statement provides a direct comparison of the smoothness of gypsum board faced with a non-woven glass fiber mat in accordance with the present invention and board faced with non-woven glass fiber mats having average diameter outside the claimed diameter range, substantiating the surprising and unexpected smoothness afforded by the present gypsum board.

By way of contrast, Jaffee fails to recognize any of these benefits, which are clearly entirely unexpected and surprising. It is respectfully submitted that the presence of these advantageous benefits, which would not otherwise be obtained, provides ample basis for predicated patentability of claims 1-3, 8-15, 21-24, 27, 29, and 32 over Jaffee, under the standard of *In re Geisler*, 116 F.3d at 1465, 1470, 43 USPQ2d at 1362, 1365 (Fed. Cir. 1997). ["The court in *Soni* summed up the rule of that case as follows: '[W]hen an applicant demonstrates *substantially* improved results, as *Soni* did here, and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to



the contrary.' citing *In re Soni*, 34 USPQ 2d 1684, 1688 (Fed. Cir. 1995). Emphases in the original.]

Applicant respectfully maintains that the data set forth as Comparative Example 1 and Examples 2-5 are sufficient to satisfy the test of *Geisler* and *Soni*. It is submitted that these data clearly establish that the properties of the present mat and board are surprising and unexpected over the prior art of record, and the Examiner has not pointed to any evidence to the contrary, as would be required under the *Geisler* and *Soni* test for an obviousness rejection. In particular, the Examiner's attention is respectfully drawn to Example 5, beginning on page 16 of the specification. The properties of gypsum boards constructed with the non-woven fibrous mats prepared in Examples 2-4 are compared with gypsum board constructed with the prior art mat of Comparative Example 1, which employs fibers having an average diameter of 13  $\mu\text{m}$ , a value clearly within the range delineated by Jaffee. As set forth at page 17, lines 7-15, the Example 2-4 boards have a smoothness rating of 8, whereas the Comparative Example 1 board has a smoothness of only 4. It is submitted that these data clearly demonstrate the unexpected and surprising smoothness of gypsum board prepared using mat facers having the particular fibers required by applicant's claims. Absent any evidence to the contrary adduced by the Examiner, applicant maintains that the requirements of *Soni* and *Geisler, supra*, are satisfied, obviating any need for further evidence.

Applicant further traverses the Examiner's assertion that:

"In the specification, the Applicant did not fully disclose the details of the experiments. In particular, the Applicant did not disclose the length of the fibers, the percentage of fibers, and the

amount of binder used in Examples 2-4 so a fair comparison cannot be made between the inventive examples and the conventional example." (page 9 of the Office Action dated July 25, 2006, page 9, last paragraph.)

In particular, it is submitted that 35 USC 112 requires only that sufficient detail be provided to enable a person skilled in the art to make and use the disclosed invention. As a result, applicant maintains that the description of the examples is, in fact, sufficient to permit the comparison suggested by the Examiner. ("A patent is not a scientific treatise, but a document that presumes a readership skilled in the field of the invention." *Ajinomoto Co., Inc. v. Archer-Daniels-Midland Co.*, 228 F.3d 1338, 56 USPQ2d 1332, 1338 (Fed. Cir. 2000)).

While applicant maintains that the foregoing comparison provided by the specification is sufficiently detailed to establish the surprising and unexpected results on which patentability is predicated, a supplemental declaration under 37 CFR 1.132 by Alan M. Jaffee is nevertheless submitted herewith in order to expedite prosecution. This Declaration provides details of the fiber lengths of glass fibers used to make certain of the mats employed in the examples.

More specifically, the Declaration establishes that the glass fiber used to prepare the mats of Examples 2-4, e.g. as delineated by Table III, were chopped glass fiber having an average fiber diameter of 11  $\mu\text{m}$  and an average fiber length of 12 mm, which dimensions fall within the numerical ranges recited in claims 1, 22, 27, 29, and 32. The Declaration further establishes dimensions of the glass fiber used to make the mats delineated at page 7, lines 29-32 of the specification. In particular, the glass fibers having fiber diameters within narrow

ranges centered at about 26, 15, 13, and 8  $\mu\text{m}$  were chopped glass fibers having fiber lengths of about 25, 25, 19, and 6 mm, respectively. None of these diameters is within the about 9.5-12.5  $\mu\text{m}$  diameter range, and only the 6 mm length is within the about 6-12 mm length range. The glass fiber having fiber diameter within a narrow range centered at about 5  $\mu\text{m}$  was flame attenuated glass fiber, for which the fibers have an extended range of fiber length. The 5  $\mu\text{m}$  diameter is also not within the claimed numerical diameter range. Accordingly, it is submitted that Examples 2-4 of the specification employed non-woven glass fiber mats made of glass fiber having average fiber diameter and length within the range delineated by claims 1, 22, 27, 29, and 32, while all the comparative examples had at least one of average fiber diameter and length that did not fall within the aforesaid numerical ranges.

The Examiner has taken cognizance of the Declaration under 37 CFR 1.132 by Alan M. Jaffee submitted previously on May 3, 2006, but has discounted it as not persuasive. In particular, that May 3 declaration provided smoothness data obtained using image processing software to analyze the appearance of the board surface when illuminated by ordinary light at grazing incidence. The Examiner has recognized, for example, that gypsum board faced with non-woven glass fiber mat having an average diameter of 11  $\mu\text{m}$  (clearly within applicant's 9.5 – 12.5  $\mu\text{m}$  range) is demonstrably smoother than board faced with 8 and 13  $\mu\text{m}$  fiber mats (just outside the claimed limits). The Declaration data also demonstrate that gypsum board faced with mat wherein the glass fibers have an average diameter of 11  $\mu\text{m}$  and an average fiber length of 12 mm is smoother than board faced with a mat having glass fibers of a similar diameter but average fiber length of 19 mm (3/4").

The May 3, 2006 Declaration is further submitted to establish that the enhanced smoothness of the 11  $\mu$ m faced board is surprising and unexpected for a person having ordinary skill in the art, who would have expected, to the contrary, that the board made with mat having the smallest fibers, i.e. the 8  $\mu$ m average fibers, would have been smoother than board made with 11 and 13  $\mu$ m mat. Also established is that a person having ordinary skill in the art would not be motivated to use shorter fibers (e.g., fibers having an average length ranging from about 6 to 12 mm) instead of fibers 19 mm (3/4") or longer because of concern about required tensile and tear strengths associated with facing gypsum board.

The Examiner has countered that the Declaration is insufficient to establish patentability. Citing *In re Hill*, 284 F.2d 955, 128 USPQ 197 (CCPA 1960), she has contended that applicant has not provided "a sufficient number of tests." Applicant submits that what constitutes a "sufficient number" must be determined on a case-by-case basis from the perspective of a person having ordinary skill in the art. Applicant maintains that the number of tests provided by the Declaration data, especially in combination with the data already provided by the specification, is sufficient, given the relatively narrow ranges delineated by claim 1.

Applicant respectfully traverses the contention that only one sample meeting the claimed diameter and length ranges and one sample outside those ranges is provided in the May 3, 2006 Declaration. While applicant agrees that of the samples in that Declaration, only Sample 2 is within the claimed diameter and length range, he nevertheless maintains that Samples 1, 3, and 4 are all outside the numerical limits of the ranges. The Examiner has

correctly acknowledged that Sample 1 is outside both ranges, Sample 3 is outside the diameter range but inside the length range, and Sample 4 is inside the diameter range but outside the length range. It is respectfully submitted that all of Samples 1, 3, and 4 must thus be regarded as being outside the combination of ranges delineated by applicant's claims, and not just Sample 1.

It is further submitted that the Examiner has not provided any legal basis for the test she has apparently applied in stating that "the Applicant has not determined a trend in the exemplified data which would allow the artisan to reasonably extend the probative value thereof... [so that] The declaration is not persuasive." Applicant maintains that he is not required to provide the sort of comprehensive scientific explanation and theory the Examiner has apparently contemplated. And to the contrary, it is submitted that a sufficient trend is in fact seen, a trend that only confirms the teaching of the patent specification, that it is surprising and unexpected that diameters higher or lower than the claimed range produce less smooth mat and board. See, e.g., page 7, lines 27-32.

In further contradistinction to the Examiner's conclusion, a person having ordinary skill in the art, and knowing the comparative smoothness of gypsum boards having mats made with fiber having average diameter of 16, 15, 13, 8, and 5  $\mu\text{m}$ , would have inferred an incorrect trend, which would have led a skilled artisan away from what applicant discovered. That is to say, one having ordinary skill in the art would have had no basis for any reasonable expectation of success, let alone any relative certainty, that a board made with mat employing

an intermediate average fiber diameter (e.g. 11  $\mu\text{m}$ ), would have the decidedly superior smoothness established by applicant's discovery.

It is submitted that the ruling of the Federal Circuit in *Fromson v. Anitec Printing Plates, Inc.*, 132 F.3d 1437, 45 USPQ2d 1269, 1276 (1997), *cert. denied*, 525 U.S. 817 (1998), is particularly apposite the present issue. The Court held as follows:

"That an inventor has probed the strengths and weaknesses of the prior art and discovered an improvement that escaped those who came before is indicative of unobviousness, not obviousness. The district court did not correctly apply the law of obviousness, for there is no suggestion or teaching in the prior art to select from the various known procedures and combine specific steps, along with a new electrical structure, in the way that is described and claimed by Fromson. The judgment of invalidity is reversed.

Applicant respectfully submits that the discovery of the present length and diameter ranges is precisely the sort of improvement that escaped previous workers, as contemplated in *Fromson*, strongly predicating the non-obviousness of the discovery delineated by independent claims 1, 22, 27, and 32, along with the claims dependent thereon.

With respect to claims 2 and 3, the Examiner has pointed to col. 3, lines 34-40 of Jaffee as teaching that E-type, C-type, T-type, and sodium borosilicate glass fibers are preferred. However, these compositions are disclosed as having an average diameter ranging from about 9 to 20 microns. Accordingly, it is submitted that the mere recitation of compositions at col. 3, lines 34-40 of Jaffee is not sufficient to render obvious claim 1, from which claims 2 and 3 depend, because the disclosed average diameter range of 9-20  $\mu\text{m}$  is far broader.

As to claims 4-6, Jaffee is said to teach mat containing a major portion of glass fibers having an average fiber diameter ranging from about 9 to 20 microns (col. 3, lines 35-40) and a minor portion of polyester fibers (abstract). The minor portion can have a diameter of 0.4-2 microns (col. 3, lines 40-47). Applicant respectfully submits that claims 4-6, which further restrict the glass fiber content of the claimed mat, are patentable over Jaffee for at least the same reasons as claim 1, from which they depend.

The Examiner has pointed to certain disclosures of fiber length, e.g. at col. 3, lines 55-60, said to be pertinent to claim 7. It is respectfully noted that claim 7 has previously been cancelled, rendering this citation moot.

The Examiner has indicated that col. 3, lines 54-56 of Jaffee discloses that the glass fibers can all have the same length. It is submitted that this disclosure is insufficient to render obvious claim 8, which calls for a majority of the fibers of the mat used in the claimed gypsum board to have a fiber length ranging from about 6 to 18 mm, because Jaffee fails to describe or suggest use of fibers wherein the average fiber ranges from about 6-12 mm. Moreover, any disclosure of fibers having the same length is clearly insufficient to overcome a lack of disclosure or suggestion of the further feature of fiber having a diameter range of about 9.5 to 12.5  $\mu\text{m}$ , which is also inherited from base claim 1.

As to claims 9-10, Jaffee's teaching of a latex binder comprising a crosslinkable vinyl chloride acrylate copolymer latex (col. 3, lines 60-67) is cited, along with disclosure of an aqueous stearylated melamine emulsion said to act as an external crosslinker (col. 4, lines 14-30). In reference to claims 11-12, an amount of crosslinker in the amount of up to 10 weight

percent is said to be taught at col. 4, lines 30-38. Col. 4, lines 15-20 is cited concerning claim 13 as providing the claimed melamine formaldehyde containing resinous binder. As to claim 14, the Examiner has cited Jaffee's disclosure of a glass transition temperature of up to 113°F, which is compared to applicant's recited range of about 15 to 45°C emulsion. Applicant respectfully observes that 15-45°C converts to 59-113°F, rather than the 15-133°F suggested by the Examiner. The purported water repellency effect of stearylated melamine at col. 4, lines 20-25 is cited with respect to claim 15. Jaffee's disclosure at col. 3, lines 18-25 of basis weights of 1.8 to 2.2 pounds per 100 square feet is cited with regard to claims 17 and 18. As to claim 19, the Examiner has pointed to certain basis weights disclosed by Jaffee. As to claims 23 and 24, the Examiner has pointed to Jaffee's disclosure that it is known to face a gypsum wall board with a fiber glass non woven mat and the incorporation by reference into Jaffee of US Patent 4,647,496.

However, applicant maintains that none of these disclosures overcomes the lack of disclosure of the 9.5 to 12.5  $\mu\text{m}$  range of average fiber diameter and the 6-12 mm range of average fiber length recited by claim 1, from which claims 2-6, 8-15, 17-19, and 21-24 depend.

In view of the foregoing remarks and the two Declarations under 37 CFR 1.132 by inventor Alan Jaffee, it is submitted that the surprising and unexpected results afforded by applicant's gypsum board moot any *prima facie* case of obviousness of claims 1-6, 8-15, 17-19, and 21-24.



As to claim 29, the Examiner has pointed to Jaffee's disclosure of a nonwoven fibrous mat for use as a facer on a gypsum board (col. 2, lines 1-15), the mat comprising a major portion of textile glass fibers and a minor portion of polymer fibers (col. 2, lines 50-60). The Jaffee mat is said to be bound together with a latex (col. 2, lines 35-45). Glass fibers having a length between 0.25 and 1 inch are said to be used (col. 3, lines 55-60), as are fibers with an average diameter ranging from about 9 to 20 microns (col. 3, lines 35-40).

It is respectfully submitted that the same considerations demonstrating lack of obviousness of claim 1 over Jaffee are equally applicable to claim 29. In particular, it is submitted that Jaffee does not disclose (i) the particular combination of average fiber diameter range of about 9.5 to 12.5  $\mu\text{m}$  and average fiber length range of 6-12 mm recited by both claims 1 and 29, or (ii) any species falling within that range. As a result, any gypsum board constructed in accordance with the teaching of Jaffee would lack the surprisingly unexpected and highly desirable properties including, *inter alia* a smooth, easily finished surface, exhibited by the mat-faced gypsum board defined by claim 29. Accordingly, it is submitted that claim 29, as well as claims 30-31 dependent thereon, patentably define over Jaffee. For at least the same reasons as set forth hereinabove concerning claims 1 and 29, applicant respectfully submits that claim 32 patentably differentiates Jaffee.

Claims 26 and 30-31 are submitted to be patentable over Jaffee for at least the same reasons as claims 1 and 29, from which they respectively depend. That is to say, it is submitted that Jaffee fails to disclose or suggest any gypsum board faced with a mat comprising a web wherein the glass fibers consist essentially of fibers having an average

diameter ranging from about 9.5 to 12.5  $\mu\text{m}$  and an average length ranging from about 6 to 12 mm, as required by claim 1, from which claim 26 depends, or by claim 29, from which claims 30-31 depend. If for no other reason, claims 26 and 30-31 are patentable over Jaffee for the same reasons as claims 1 and 29, from which they depend.

But even less is there any disclosure or suggestion of a gypsum board that would exhibit flame resistance sufficient to pass the test of ASTM Method E84, Class 1, as recited by claim 26, or a fibrous mat as recited by claim 31 that would have a permeability of at least about 250  $\text{cfm/ft}^2$ , as measured in accordance with ASTM Standard D237. While the Examiner has admitted that there is no explicit disclosure or suggestion in Jaffee of such flame resistance or permeability, she has asserted that such properties may be presumed to be inherent and that the burden is upon applicant to prove otherwise under *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (C.C.P.A. 1980) and *In re Best*, 562 F.2d 1252, 195 USPQ 430 (C.C.P.A. 1977).

Applicant respectfully submits that the Examiner's reliance on *Fitzgerald* and *Best* is misplaced, inasmuch as the factual situation required for those cases to be apposite is not satisfied in the present instance. The Examiner further points to footnote 4 of the *Best* decision for the proposition that a rejection may be made alternatively for obviousness under 35 USC 103 or anticipation by inherency under 35 USC 102. However, the *Best* holding, which was affirmed by *Fitzgerald, supra*, was predicated on the substantial identity of the claimed and prior art products. ["Where, as here, the claimed and prior art products are identical or substantially identical... the PTO can require an applicant to prove that the prior

art products do not necessarily or inherently possess the characteristics of his claimed product.” *Best, supra*, at 1255, emphasis added.]. In the present instance, therefore, the gypsum board of claim 26 and the fibrous mat of claim 31 must be substantially identical to the gypsum board and fibrous mat allegedly provided by the Jaffee disclosure for *Fitzgerald* and *Best* to be applicable.

Applicant respectfully traverses any such identification. The Examiner has admitted that Jaffee does not disclose or suggest flame resistance, but instead relies on the presumed inherency of such a feature in the Jaffee gypsum board. As set forth hereinabove in connection with the 103(a) rejection of claim 1 over Jaffee, gypsum board employing mat comprising chopped glass fibers of the particular diameter range applicant requires is not disclosed or suggested by Jaffee. To the contrary, the preferred diameter ranges and the disclosed species all employ larger diameter fibers. As a result, it is submitted that there are substantial differences between any gypsum board disclosed or suggested by Jaffee and the board recited by claim 1, on which claim 26 depends, precluding application of *Fitzgerald* or *Best* in respect of claim 26, which requires the products to be substantially identical.

Even less is there any warrant for applying the *Fitzgerald* or *Best* decisions to claim 31. As set forth hereinabove, Jaffee prefers the use of chopped glass fibers larger in diameter than those recited by claim 29. Moreover, far from being silent as to permeability, Jaffee discloses that mat having a minor portion of glass microfibers (i.e. fibers smaller in diameter than the aforementioned chopped glass fibers) has very small windows that catch very fine particles and provide high efficiency filtration. Applicant thus submits that the finding that a high

permeability can be attained in mat comprising fibers of smaller diameters, as delineated by claim 31, is surprising and unexpected. Such properties are exhibited by exemplary mats of the invention, e.g. as set forth in the Examples of Table 3.

As a result, it is maintained that the burden to prove that the claimed properties are not exhibited by the Jaffee mat has not properly been shifted to applicant. Accordingly, it is submitted that the Examiner has not established a proper basis on which the rejection based on presumed inherency could properly be predicated.

Applicant has further pointed, *arguendo*, to US Patent 4,637,951 to Gill et al., which discloses a fibrous glass mat that includes a majority of base fibers having a mean diameter in the range of 10 microns with a minor amount of microfibers (Abstract). Importantly, such a mat has a fiber content that lies within the ranges delineated by Jaffee, which teaches an embodiment that can include microdenier synthetic polymer fibers in minor proportions in combination with glass fibers having average diameters from about 9 microns to about 20 microns. See, e.g., col. 3, lines 38-40 and 47-50 of Jaffee. However, the Gill et al. mat preferably has a porosity of no greater than 225 cubic feet per minute per square foot of mat as measured using the Frazier Air Permeability Test (Abstract). In other embodiments, the Gill et al. mat has even lower air permeability, e.g. 180 cubic feet/min (col. 5, line 59); and 40-225 cubic feet/min (claims 3 and 12). Such data clearly refute any presumption that mats disclosed by Jaffee inherently all have an air permeability of greater than about 300 cubic feet/minute/square foot, as delineated by claim 31. ["Before a reference can be found to disclose a feature by virtue of its inherency, one of ordinary skill in the art viewing the

reference must understand that the unmentioned feature at issue is necessarily present in the reference. The test of inherency is not satisfied by what a reference 'may' teach. ('Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.') (*SGS-Thomson Microelectronics, Inc. v. International Rectifier Corp.*, 32 USPQ 2d 1496, 1503 (Fed. Cir.) (unpublished), *cert. denied*, 513 U.S. 1052 (1994), quoting *Continental Can*, 948 F.2d at 1268-69, 20 USPQ 2d at 1749-50.)

Applicant respectfully submits that the Examiner's dismissal of the foregoing argument with respect to Gill is improper, it being alleged that the applicant is required to show that the mat of Jaffee does not inherently have applicant's air permeability range. Applicant continues to maintain the position that the burden of showing the prior art Jaffee mat does not have applicant's claimed air permeability range has not been properly transferred to applicant under the *Best* and *Fitzgerald* standard. However, even if *arguendo* that burden has been shifted, it is submitted that the Gill teaching remains pertinent and rises to the level of any required showing, because mats disclosed by Gill contain fibers that clearly fall within the range delineated by Jaffee.

In the present instance, the Examiner has not pointed to any disclosure or suggestion in Jaffee (or elsewhere) that differentiates the air permeability of mats broadly disclosed, at least some of which lack the air permeability required by claim 31, from those made with the particular range of average glass fiber diameter recited by applicant. Accordingly, it is submitted that the preferred mat delineated by claim 31 is novel and unobvious over Jaffee.

With respect to applicant's position concerning claims 26 and 31, the Examiner has made the following statement:

"Since Jaffee meets each and every chemical and structural requirement for the gypsum board composite set forth in the claims, the composite must meet the flame resistance and permeability that depends from said requirements. Since no other structural or chemical features are claimed in the independent claims, which may distinguish the present invention from Jaffee, the presently claimed flame resistance and permeability is deemed to be inherent to Jaffee." (Office Action dated July 25, 2006, page 11, first full paragraph)

Applicant respectfully disagrees. As set forth above, Jaffee does not disclose any species that fall within the numerical ranges delineating the particular fibers used in applicant's mat and gypsum board. Applicant also submits that Jaffee does not disclose the air permeability of any mat, and the Examiner has acknowledged the lack of disclosure of the limit of air permeability of about 300 cubic feet/min/square foot recited by claim 31. Moreover, as established by the disclosure in Gill et al. cited above, at least some of the mats within the ambit of the Jaffee disclosure do not possess the requisite air permeability, precluding any argument that the requisite air permeability is inherently present in every Jaffee mat. On the other hand, claim 31 is directed to a preferred fibrous mat, in which a structural property is recited, albeit in functional form of a limit on air permeability. The courts have repeatedly affirmed the propriety of using functional language to recite a structural feature in a claim. *In re Schreiber*, 128 F.3d 1473, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997), quoting *In re Swinehart*, 439 F.2d 210, 212, 169 USPQ 226, 228 (CCPA 1971) ("[T]here is nothing intrinsically wrong with [defining something by what it does rather than

what it is] in drafting patent claims."). Applicant accordingly traverses the Examiner's apparent contention that a structural element is missing from any of applicant's claims.

Moreover, in view of the aforementioned disclosure of Gill et al., applicant maintains that the Examiner's rejection does not rise to the level of the test elucidated by the Board of Patent Appeals and Interferences in *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (B.P.A.I. 1986). In particular, it is submitted that the rejection does not provide sufficient evidence or scientific reasoning to establish the reasonableness of the Examiner's belief that the functional limitation is an inherent characteristic of the prior art Jaffee mat. The BPAI specifically requires such a showing before the requirement ("this burdensome task") to show the lack of inherency can be invoked, as it was in the present instance.

For these reasons, it is submitted that Jaffee does not disclose or suggest a gypsum board or mat having the outstanding combination of properties afforded by the gypsum board recited by present claim 26 and the mat of claim 31.

In view of the foregoing remarks and the Declarations Under 37 CFR 1.132 by Jaffee, it is submitted that claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32, are novel over Jaffee.

Accordingly, reconsideration of the rejection of claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32 under 35 USC 103(a) as being unpatentable over Jaffee is respectfully requested.

Claim 20 was rejected under 35 USC 103(a) as being unpatentable over Jaffee in view of US Patent 6,365,533 to Horner, Jr., et al., which relates to a low fiber, plyable facer suitable for use in insulation board manufacture.

Applicant respectfully disagrees with the Examiner's position that Jaffee teaches the invention recited by claim 20, except for disclosure of a second face comprising kraft paper. The structural and functional distinctions between Jaffee's board and the board defined by applicant's claims are set forth hereinabove in connection with the 103(a) rejection of claims 1-6, 8-15, 17-19, 21-24, 26-27, and 29-32 over Jaffee. Clearly, Horner, Jr., et al. does not disclose or suggest an average fiber diameter ranging from about 9.5 to 12.5  $\mu\text{m}$ . In this respect the Horner, Jr. et al. teaching does not appreciably add to the Jaffee teaching, and cannot be combined therewith to render obvious the board called for by applicant's claims. Inasmuch as Horner, Jr. et al. does not cure the aforementioned deficiencies of Jaffee, its combination therewith does not render obvious the invention of claim 20.

For these reasons, and those set forth above, it is submitted that the proposed combination of Jaffee and Horner, Jr., et al. does not disclose or suggest the gypsum board recited by present claim 20.

Accordingly, reconsideration of the rejection of claim 20 under 35 U.S.C. 103(a) as being obvious over the combination of Jaffee and Horner, Jr., et al. is respectfully requested.

Claim 25 was rejected under 35 USC 103(a) as being unpatentable over Jaffee in view of US Patent 7,056,582 to Carbo, which discloses acoustical tiles, also known as acoustical



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panels, ceiling tiles, or ceiling panels, that are said to inhibit the growth of fungus, bacterial and other micro-organism.

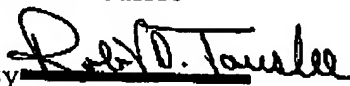
For at least the reasons set forth hereinabove, it is submitted that Jaffee fails to disclose or suggest the claimed invention, notwithstanding the assertion of the Examiner. Clearly, Carbo, whether taken singly or in combination with Jaffee, does not remedy the lack of disclosure or suggestion of the particular fiber constituents provided by the mat recited by applicant's claim 1, on which claim 25 depends.

Accordingly, reconsideration of the rejection of claim 25 under 35 U.S.C. 103(a) as being obvious over the combination of Jaffee and Carbo is respectfully requested.

In view of the declaration under 37 CFR 1.132 submitted herewith and the remarks set forth above, it is respectfully submitted that the present application has been placed in allowable condition. Reconsideration of the rejection and allowance of claims 1-6, 8-15, 17-27 and 29-32 are, therefore, earnestly solicited.

Respectfully submitted,

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